Space Weather Forecast

Issued on Sunday, 16 October 2022 at 01:22 Local

This forecast provides a four day assessment of space weather events. The probabilities stated below are for reaching or exceeding the given levels. For more information about space weather impacts please see the Met Office Space Weather Scales https://www.metoffice.gov.uk/weather/learn-about/space-weather/uk-scales

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Space Weather Forecast Headline: No significant space weather is expected.

Analysis of Space Weather Activity over past 24 hours

Solar Activity: Solar activity has returned to Low or Very Low levels, with isolated Common class flares. The large sunspot that was on the northwest limb has now rotated over the horizon and is no longer visible on the Earth-facing solar surface, but its associated magnetic structure is visible above the Sun's northwest limb. This leaves three numbered and one un-numbered small and simple sunspots on the disc, all in the western hemisphere. There are also a number of filaments (lines of material held together by the Suns magnetic field) on the Earth-facing disc. These can be a source of coronal mass ejections (CMEs), and one of these erupted in the southwest at 14/2200 UTC. Modelled results indicate that the bulk of the ejecta will pass below Earth orbit, and although a weak glance late on day 3 (18th) or early on day 4 (19th) is possible, no significant impacts are anticipated. A further filament eruption in the southwest around 15/1430 UTC does not appear to have emitted a CME.
No other Earth-directed CMEs have been observed.

Solar Wind / Geomagnetic Activity: The solar wind, is indicative of the connection with CH32. Slightly elevated speeds at 450 km/s increased, at times rather erratically, to elevated levels around 550 km/s. The total magnetic field strength, was Moderate at first, but has become weak in recent hours. The important north-south component, fluctuated moderately at first but was mainly directed northwards. This measure similarly has become weak in recent hours. Geomagnetic activity was G1/Minor Storm 15/0000-0300 UTC and Active (Kp 4) 15/1800-2100 UTC. Otherwise, Quiet to Unsettled (Kp 1 to 3).

Energetic Particles / Solar Radiation: The count rate of energetic particles (high energy protons) remained at background levels.

Four-Day Space Weather Forecast Summary

Solar Activity: Solar activity is forecast to be mostly Low.

Solar Wind / Geomagnetic Activity: There are no Earth-directed CMEs, however the peripheral effects of a CMEs passing south of Earth late day 1 or early day 2 (16th or 17th), and again late on day 3 (18th) or early day 4 (19th) may be observed. Otherwise, the ongoing fast wind influence from the coronal hole is expected to ease towards background. Geomagnetic activity is forecast to be Quiet to Unsettled, but with a chance of Active intervals early or late day 1 (16th), or early day 2 (17th), and again late day 3 (18th) into day 4 (19th).

Energetic Particles / Solar Radiation: The count rate of energetic particles is expected to remain at background levels with no solar radiation storms occurring.

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Geomagnetic Storms:

Geo-Magnetic Storm Probability (Exceedance)	Level	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Minor or Moderate	G1 to G2	Yes	5	5	5	5
Strong	G3	No	1	1	1	1
Severe	G4	No	1	1	1	1
Extreme	G5	No	1	1	1	1

Radio Blackouts - X Ray Flares:

X Ray Flares Probability	Level	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Active	R1-R2 M Class	No	10	5	5	5
Very Active	R3 to R5 X	No	1	1	1	1

Solar Radiation Storms - (High Energy Protons):

Radiation Storms Probability (Exceedance)	Level (cm^{-2} sr^{-1} s^{-1})	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Active	≥ S1	No	1	1	1	1
Very Active	≥ S3 *	No	1	1	1	1

* S3 ≥ 10 MeV ≥ 1000 pfu and / or ≥ 50 MeV ≥ 10 pfu. (pfu = $cm^{-2}sr^{-1}s^{-1}$)

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